ABSTRACT

An electric arc welder for performing a given weld process with a selected A.C. pulse current waveform performed between an electrode and a workpiece, where the current waveform includes a positive segment and a negative segment, with at least one segment including a peak current and background current. The welder comprises: a power source with a controller having a digital processor including a program to calculate the real time power factor of the weld current and weld voltage where the program includes an algorithm to calculate the rms weld voltage, the rms weld current and the average power of said power source; a circuit to multiply the rms current by the rms voltage to produce an rms power level; a circuit to divide the average power by the rms power to create a value representing the actual real time power factor of said power source; and, a circuit to adjust said background current to maintain said power factor at a given level, which is manually adjusted to set the heat of the weld.